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XV

EXPEDITION TO THE REVILLAGIGEDO ISLANDS, MEXICO, IN 1925

LAND SHELLS OF THE REVILLAGIGEDO AND TRES MARIAS ISLANDS, MEXICO[1]

BY

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The Tres Marias Islands have long been of interest to naturalists, especially ornithologists, as several forms of bird life are peculiar to them. They have been visited by Grayson, Forrer, Richardson, Nelson and Goldman, and Fisher, collectors, who appear to have paid most attention to vertebrate life, as prior to the Academy's expedition only nine species of land mollusks were reported from the group, and these with few exceptions were referred, not to the particular island from which they came, but simply to the "Tres Marias." Of these, five have not been identified from the Academy's collection, and to make the list complete, references to them have been included here. It may be suspected, however, that some of them are misidentifications for species actually collected by the Academy's expedition.

The few species collected by the expedition at the isolated Clarion Island are of especial interest, as only one of them had

[1] All of the previous papers dealing with the scientific results of the expedition appear in the current volume of Proceedings (XV) No. 1, pp. 1-113 containing the general report with itinerary.

previously been obtained and that in a condition precluding description. It may be mentioned that the marine shells of Clarion Island, judging by the few which have come to hand, are more closely related to the tropical Pacific fauna than to that of continental America.

It is notable that the land-shell fauna of the Tres Marias is distinctly related to that of Mexico proper,—the Epiphragmophoras and peculiar Bulimuli of Lower California are conspicuously absent. The only large species are the Oxystylas; the *Drymæus* and *Polygyra* belong to the smaller forms of their genus. All the Socorro species are small, and only the Clarion Island *Succinea* is comparable in size to the average continental species. In short, in all these islands there is nothing but the *Oxystyla* which might not have easily been introduced by the natural means of distribution from the nearest land. The fact that recorded continental distribution of most of the species is from the eastern part of Mexico and middle America, is probably due to the lack of exploration for these minute forms in the western portion of these countries.

The following lists show the distribution of the species among the several islands. The species designated from Maria Madre of the Tres Marias have an M prefixed; those from Maria Magdalena a G; and those recorded only from the group without designation of the particular island have a T.

Species from the Tres Marias

M. G. Euglandina mariana
M. Euglandina mazatlanica
T. Euglandina albersi
M. G. Opeas rarum
M. Cæcilioides consobrina prima
M. G. Leptinaria martensi
M. G. Pseudosubulina evermanni
M. Oxystyla delphinus nebulosa
M. Oxystyla delphinus nesiotica
T. Oxystyla princeps
T. Drymæus trimarianus
M. Drymæus uhdeanus tepicensis
M. G. Polygyra richardsoni paucicostata
T. Polygyra ventrosula
T. Polygyra bicruris
M. G. Thysanophora materna

M. G. Guppya perforata
M. G. Guppya montanicola
M. G. Punctum pygmæum
M. G. Punctum pygmæum rotundum
M. G. Punctum pygmæum albeola
M. Punctum planatum
M. Gastrocopta pellucida
M. G. Vitrea indentata
M. Proserpinella hannae

Species from Socorro Island

Cæcilioides consobrina prima
Pseudosubulina evermanni
Guppya capsula
Guppya montanicola
Guppya socorroana
Strobilops labyrinthica
Strobilops strebeli
Punctum pygmæum
Punctum pygmæum albeola
Gastrocopta pellucida
Gastrocopta pellucida hordeacella
Zonitoides socorroënsis
Tornatellides mexicana
Succinea socorroënsis

Species from Clarion Island

Thysanophora clarionensis
Gastrocopta pellucida
Gastrocopta pellucida hordeacella
Tornatellides clarionensis
Succinea clarionensis

The absence of *Succinea* from the Tres Marias is peculiar, as it is one of the forms usually most easy to detect. It may be noted that a very large proportion of the collection consists of dead shells, and the few fresh ones have indications of being in æstivation, probably owing to the season of the year.

I am under obligations to Dr. H. A. Pilsbry, of the Philadelphia Academy of Natural Sciences, for assistance in identifying some of the minute forms of which he is the acknowledged master.

Genus **Euglandina** Crosse and Fischer, 1872

1. **Euglandina mazatlanica** Martens

Glandina mazatlanica Martens, Biol. Centr. Am., p. 65, pl. 4, figs. 2, 2a, 1891.

Glandina mazatlanica Martens, var. *abbreviata* Martens, l. c., p. 65, pl. 4, fig. 3, 1891.

The variety is reported as collected at the Tres Marias by Forrer, with the typical form.

2. **Euglandina albersi** Pfeiffer

Achatina (Glandina) albersi Pfeiffer, Proc. Zool. Soc. 1854, p. 295.

Glandina albersi Martens, Biol. Centr. Am., p. 75, pl. 4, figs. 10, 10a, 1891.

Collected by Forrer at Mazatlan and the Tres Marias.

3. **Euglandina mariana** Dall, new species

Plate 35, figure 4

Shell pinkish fawn-color, having the general form of *E. rhoadsi* Pilsbry, from eastern Mexico, as figured in the Proceedings of the Academy of Natural Sciences for 1903 (p. 771, pl. 47, figs. 3, 3 a-b), but much smaller; whorls, six and a half, the nucleus smooth, of two and one-half whorls; subsequent whorls finely axially striated, polished, the folds not coronate at the suture and becoming obsolete near or slightly beyond the periphery of the last whorl; whorls moderately convex; suture distinct but not deep; aperture narrowly ovate, the outer lip not sharp; pillar concavely arcuate, sharply truncate, shorter than the aperture; length of shell, 29; of last whorl, 20; of aperture, 14; maximum diameter 10 mm.

Type: No. 2190, Mus. Calif. Acad. Sci.; collected by the Academy expedition on Maria Madre and **Maria Magdalena, Tres Marias islands.**

In the literature the lines between nominal species are very closely drawn, but I can not make this shell agree with any of those figured.

Dr. H. A. Pilsbry has described in the Proceedings of the Academy of Natural Sciences, Philadelphia, for 1925, p. 308,

a possible variety of *E. turris* Pfeiffer, which he calls *E. turris longuris,* the type coming from Mazatlan, but other specimens recorded from the Tres Marias. According to the excellent figures given in his article the species is larger, more inflated in proportion, and more coarsely axially striated than *E. mariana.*

Genus **Opeas** Albers, 1850

4. **Opeas rarum** Miller

Opeas rarum Miller, Malak. Blatt., n. ser., 1. p. 125, pl. 14, fig. 2, 1879—Strebel, Beitr. V, p. 103, pl. 17, figs. 8, 17; pl. 7, fig. 5, 1882—Pilsbry, Manual, XVIII, p. 208, pl. 29, figs. 82, 83; 1906.

A single fresh specimen was collected on Maria Magdalena Island, Tres Marias, 6.5 mm. in length. This form is also reported by Strebel from San Miguel, Jucuma, Guatemala, and a slight variation from Mirador, Vera Cruz.

Genus **Cæcilioides** Herrmannsen, 1846

5. **Cæcilioides consobrina prima** De Folin

Achatina consobrina Orbigny, Moll. Cuba V, p. 89, pl. XI *bis,* figs. 10, 11, 12; 1845.

Achatina pygmæa Pfeiffer, Zeitschr. f. Malak. 1847. p. 148.

Karolus primus De Folin, Fonds de la Mer, 1. p. 189, pl. XXVI, figs. 7, 8; 1870.

Achatina iota Strebel, Beitr. Mex. Land u. Süssw. Conch. II, 1875, p. 53, pl. 13, fig. 50.

Cæcilianella veracruzensis Crosse & Fischer, Moll. terr. et fluv. Mexico, p. 591, pl. 26, fig. 4, 1878.

Cæcilioides (Cæcilianopsis) jod Pilsbry, Nautilus, XXI, p. 28, 1907.

Cæcilioides consobrina Pilsbry (ex parte) Man. Conch. XX, p. 39, pl. 5, figs. 81, 82, 1909.

Collected by the Academy expedition on Maria Madre of the Tres Marias Islands, near the village on the east side; and on Socorro Island, on the north slope of Mount Evermann at from 2,000 to 2,800 feet elevation, and on the lowlands at Braithwaite Bay and Grayson's Cove.

This species is very widely distributed, being originally described from Cuba and later recorded with slight variations

from Panama and various localities in Mexico. Its minute size renders it peculiarly fitted for accidental transportation by birds and violent winds.

Genus **Leptinaria** Beck, 1839

6. **Leptinaria martensi** Pfeiffer

Plate 35, figure 5

Bulimus martensi Pfeiffer, Proc. Zool. Soc. 1856, p. 318.

Spiraxis martensi Crosse & Fischer, Miss. Sci. Mex., Moll. 1, p. 619, pl. 25, fig. 9, 1878.

Lamellaxis modestus Strebel, Beitr. V, p. III, pl. 7, fig. 15, pl. 17, figs. 5a-b, 6a, 7b, 31.

Leptinaria martensi Martens, Biol. Am. Centr., p. 316, with variety *inflata*, 1898.

Leptinaria martensi Pilsbry, Man. XVIII, p. 308, pl. 41, figs. 6, 7, 8, 1907.

Collected by the Academy expedition on Maria Madre and Maria Magdalena, Tres Marias Islands.

There was only one fresh specimen in the lot. The others varied from 6 to 7.5 mm. in length. The pillar has no lamella but a smooth swelling, and a section shows the tubular axis somewhat angularly twisted and rapidly diminishing in diameter toward the apex.

This form has such feeble striation axially that the shell appears smooth except for incremental lines. I follow Doctor Pilsbry in referring it to *Leptinaria* though it offers quite a contrast to the average species of that genus and as far as I know has not been anatomically examined.

Genus **Pseudosubulina** Strebel, 1882

7. **Pseudosubulina evermanni** Dall, new species

Plate 35, figures 7, 8

Shell slender, subcylindrical, with nearly seven whorls, the first small and smooth, forming a blunt apex to the shell; the second finely, closely, axially striated; the remainder with straight thread-like low axial riblets with wider interspaces; suture distinct, not coronated by the riblets; whorls moder-

ately rounded; base evenly rounded, imperforate, pillar straight, pillar lip hardly truncate; height, 4.52; diameter, 1.5 mm.

Type: No. 2192, Mus. Calif. Acad. Sci.; collected by the Academy expedition on the **slope of Mount Evermann, Socorro Island,** at from 2,000 to 2,800 feet elevation; *paratype:* No. 2193, from Maria Magdalena Island; others were taken on the east side of Maria Madre Island, near the village.

Doctor Pilsbry notes in regard to this species that it appears to be related to east Mexican species such as *P. orizabensis* Pilsbry. The regular spacing of the ribs, their early appearance, only the first whorl being smooth, and the small size of the shell, are the chief differential characteristics.

Genus **Oxystyla** Schlüter, 1838

(Zebra Shuttleworth, 1852. *Ortalichus* Martens, 1893.*)*

8. **Oxystyla delphinus,** forma **nebulosa** Strebel

Zebra delphinus forma *nebulosus* Strebel, Revision subfamily Orthalicinæ, p. 31, pl. 3, fig. 47, 1909.—Pilsbry, in Tryon's Manual, XII, pl. 16, fig. 5, 1899.

Maria Madre Island, Tres Marias, Academy Expedition. Strebel cites it from Mazatlan and Misantla, Vera Cruz, Colima, and Costa Rica. It was collected on one of the Tres Marias islands (probably Maria Madre) by Grayson, Forrer, and Richardson. Specimens from Maria Magdalena in the National Museum were collected by Nelson and Goldman. Specimens almost identical in form and color pattern were collected by Lieutenant Herndon, U. S. N., on the Amazon River, Brazil.

This form is distinguished by its relatively slender and produced shape; a dark-brown smooth nucleus; the obsolescence or entire absence of the spiral brown bands on the last whorl, which are barely indicated by slight angularities in the dark axial streaks. The surface is closely sculptured by minute spiral striation. The outer lip, body, and a single varical marking, are of rich dark brown; the edge of the nearly straight pillar is white.

It is somewhat remarkable that so large a species as this should be found on these islands abundantly, while *Epiphragmophora,* so common on the peninsula, is absent, and leads to a suspicion that the former might have been artificially introduced. A specimen of *Oxystyla* was collected on Socorro Island by Grayson, according to Pilsbry, but the species is uncertain.

It would seem from the literature and figures that several of the species of *Oxystyla* have an albinoid mutation in which the body of the shell is white while the dark-colored varical stripes and sometimes the spiral bands retain their color. These pale forms have been tentatively associated together and grouped under various names, chiefly *O. melanocheilus* Valenciennes, while others apparently of the same nature have been called *O. fulvescens* Pfeiffer, *O. leucochilus* Crosse & Fischer, etc. The mutation of *O. delphinus* belonging to this type does not agree exactly with any of those figured but is most like Strebel's figure 45[2]. It seems desirable therefore to distinguish it.

9. **Oxystyla delphinus** forma **nesiotica** nov.

Plate 35, figure 3

The shell is white with a minute brown nucleus and occasionally with faint obsolescent obliquely axial flammules simulating those of normal *delphinus,* but usually white except for the blackish varical streaks of which there are two to four on the body whorl and one or two on the penultimate whorl. The margins of the aperture and the parietal region are blackish brown as in the normal form. The height of the shell varies from 50 to 60 mm. and the specimens examined average a little less slender than the specimens of *delphinus.* In well-preserved specimens the surface is more or less covered with a pale yellowish extremely thin periostracum, which is generally missing over the greater part or the whole of the shell.

Type: No. 2194, Mus. Calif. Acad. Sci., taken with the normal form on **Maria Madre Island.** This is probably what has

[2] Revision d. unterfam. d. Orthalicinen, pl. 3, fig. 45.

been reported as collected at the Tres Marias by Forrer and Richardson under the name of **melanochilus.**

10. **Oxystyla princeps** Broderip

Bulinus princeps (Broderip) Sowerby, Conch. Ill. *Bulinus,* fig. 18, 1833.
Orthalicus princeps Mörch, Malak. Blatt. VI, p. 112. 1859.
Ortalichus princeps Martens, Biol. Centr. Am., p. 182, pl. 10, figs. 3, 3 a-b, 4-7, 1893.

Collected at the Tres Marias by Forrer and Richardson. This species has a very wide distribution, being reported from northern Mexico to Panama.

Genus **Drymæus** Albers, 1850

11. **Drymæus uhdeanus,** var. **tepicensis** Martens

Otostomus uhdeanus var. C, *tepicensis* Martens, Biol. Centr. Am., p. 234, pl. 15, fig. 5, 1893.

Tepic, State of Jalisco, West Mexico: Höge. Two (one poorly preserved) specimens were collected on Maria Madre Island, Tres Marias, by the Academy expedition.

The fresher one of the two had been aestivating on some twig, and part of the bark remains closing the aperture.

12. ? **Drymæus** sp. juv.

Some nepionic specimens were obtained by the Academy expedition on Maria Madre, which appear to belong to a species of this genus but not to the species referred to above. However, they are too immature for definite determination.

13. **Drymæus trimarianus** Martens

Otostomus trimarianus Martens, Biol. Centr. Am., p. 216, pl. 13, fig. 17, 1893.

Martens described this species from specimens collected at the Tres Marias by Forrer and Richardson. He states that it almost forms a connecting link between *D. attenuatus, D. serperastrum,* and *D. pallidior* Sowerby. Some specimens are

entirely white, others have more or less distinct traces of pale brown spots on the penultimate whorl, arranged in four rows. The shells measure from 27 to 32 mm. in length and from 12 to 14 mm. in diameter.

Genus **Polygyra** Say, 1817

14. **Polygyra ventrosula** Pfeiffer

Helix ventrosula Pfeiffer, Proc. Zool. Soc. 1845, p. 131—Binney, Terr. Airbr. Moll. N. Am. IV, p. 72, pl. 77, fig. 14, 1859.

Polygyra ventrosula Martens, Biol. Centr. Am., p. 169, pl. 7, figs. 10 a-c, 11, 1892; var. *hindsi* Pfeiffer, l. c. p. 132, 1845—Binney, l. c. III, p. 17; IV, p. 92, pl. 78, figs. 5, 6, 8, 1859.

Tres Marias, Forrer (the variety). Maria Madre, Nelson and Goldman.

15. **Polygyra richardsoni** Martens

Plate 36, figures 3, 4, 5

Polygyra richardsoni Martens, Biol. Centr. Am., p. 168, pl. 7, figs. 9, 9 a-c, 1892; Presidio de Mazatlan, Sinaloa, Mexico, Richardson.

A form designated by Doctor Pilsbry as a variety of this species under the name of *paucicostata* was obtained by the Academy's expedition on Maria Madre and Maria Magdalena of the Tres Marias, and by Nelson and Goldman on both islands. It differs from the typical *richardsoni* in somewhat larger size, larger umbilicus and in a somewhat differently shaped basal lamella.

The group to which these species belong is represented by a large number of closely allied forms in northwestern Mexico. It is difficult to decide what is specific and what merely varietal value to assign to the differences. The size of the shell varies a good deal in specimens from the same locality and as far as the writer can judge the most persistent characters are the size of the umbilicus and the form of the basal lamella in the aperture.

16. **Polygyra bicruris** Pfeiffer

Helix bicruris Pfeiffer, Proc. Zool. Soc. 1857, p. 109.

Polygyra bicruris Martens, Biol. Centr. Am., p. 168, pl. 7, figs. 8, 8 a-c, 1892.

Tres Marias Islands, Forrer and Richardson.

Genus **Thysanophora** Strebel, 1880

17. **Thysanophora materna** Dall, new species

Plate 35, figures 16, 17

Shell minute, slightly rufous brown, four whorled, the spire slightly elevated with a rather deep suture; whorls well-rounded above and below, the last descending slightly near the aperture; umbilicus deep, subcylindrical; aperture subcircular, a little oblique, the lips thin, sharp, not reflected but slightly expanded; surface with low sharp incremental lines, with microscopic wrinkles crossing them irregularly and microscopic smaller wrinkles and very minute granulations in the interspaces, the whole covered with a furfuraceous periostracum to which particles of dirt adhere very abundantly; major diameter, 4; minor diameter, 3; height, 2 mm.

Type: No. 2196, Mus. Calif. Acad. Sci., and others collected by the Academy expedition on **Maria Madre Island** near the village on the east side and at another locality on the island not specified; also more abundantly on Maria Magdalena at two localities.

The sticky periostracum and peculiar sculpture are conspicuous characters. The microscopic granulation sometimes here and there is arranged in rows, but there is no real spiral sculpture and the nucleus is smooth.

18. **Thysanophora clarionensis** Dall, new species

Plate 36, figures 1, 2

Shell closely resembling *T. materna* in general appearance and with the same number of whorls, but smaller, with a flatter spire, the umbilicus more funnel-shaped, showing the edges of the whorls and the peculiar sculpture relatively less con-

densed; major diameter, 2.5, minor diameter, 2.0; height, 1.0 mm.

Type: No. 2197, Mus. Calif. Acad. Sci., and other specimens collected by the Academy expedition on **Clarion Island at Sulphur Bay** near sea-level, and at other localities from 500 to 1,040 feet above sea-level, about equally common at each place.

Genus **Guppya** Mörch, 1867

(Habroconus Crosse & Fischer, 1878.*)*

19. **Guppya perforata** Dall, new species

Plate 35, figures 12, 13

Shell minute, smooth but not polished, with about four well-rounded whorls separated by a deep suture; the spire is rather dome-like than pointed, incremental lines very oblique, faint, base well rounded; aperture oblique, semilunate, the lips sharp, slightly expanded, separated widely by the body, the inner lip slightly overshadowing a deeply perforate umbilicus; major diameter, 3; height, 3 mm.

Type: No. 2198, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Maria Madre Island**; others came from Maria Magdalena of the Tres Marias Islands. Apparently not abundant.

In the only fresh specimen, under high magnification, the thin periostracum rises slightly from the incremental lines with edges minutely serrate, but this is lost in the dead individuals.

20. **Guppya socorroana** Dall, new species

Plate 35, figures 14, 15

Shell small, pale horn-color, smooth, turbinate, with about five moderately convex whorls separated by a rather deep suture; incremental lines feeble, oblique; periphery rounded, base moderately convex; aperture semilunate, the lips sharp, very slightly expanded, widely separated by the body, the

inner lip springing from the imperforate umbilical depression; major diameter, 3.1; height, 2.8 mm.

Type: No. 2199, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Socorro Island** at 2,000 feet elevation, a single adult but bleached specimen, and another (No. 2200) on Maria Magdalena in fresh condition. It differs from all the figured allied species in having a rounded rather than a pointed apex.

21. **Guppya montanicola** Dall, new species

Plate 35, figures 10, 11

Shell small, pale straw-color, smooth, with about four and one-third whorls; upper surface finely radiated by delicate striæ starting from the suture and becoming obsolete near the periphery, the base marked only by feeble incremental lines; spire low, whorls rounded but not inflated; base moderately convex, the umbilical depression shallow, imperforate; aperture narrowly semilunate, the lips sharp, hardly expanded, the inner lip starting from the umbilical pit and widely separated from the outer one by the body of the whorl; major diameter, 2.5; height, 2.2 mm.

Type: No. 2201, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Socorro Island,** on the north slope of Mount Evermann, between 2,000 and 2,800 feet above the sea level.

This is well distinguished, even in the young, from the preceding species by its depressed form. The juvenile specimens sometimes show a minute umbilical perforation.

22. **Guppya capsula** Dall, new species

Shell minute, translucent brown above, lighter olivaceous below, not polished, of three and a half turbinate well-rounded whorls; apex dome-like, suture well marked, base evenly rounded, perforate; aperture rounded; lips sharp, not reflected, interrupted by the body; surface only marked by faint incremental lines; height, 1.2; maximum diameter, 1.1 mm.

Type: No. 2202, Mus. Calif. Acad. Sci.; collected on Socorro Island, on the north slope of Mount Evermann at from 2,000 to 2,800 feet elevation, by the Academy expedition.

Two of the specimens contained a spherical shining white egg, seemingly rather large for so minute a shell. The species appears to be rare, as only a few specimens were obtained. The figures of *Helix punctum* Morelet, given by Martens, resemble it.

Genus **Strobilops** Pilsbry, 1892

(*Strobila* Morse, 1864)

23. **Strobilops labyrinthica** Say

Helix labyrinthica Say, Journ. Acad. Nat. Sci. Phila., 1, p. 124, 1817.
Strobila labyrinthica Morse, Portland Soc. Journ., vol. 1, p. 26, figs. 64-67, 1864.
Strobilops labyrinthica Pilsbry, Nautilus, VII, p. 57, 1893.

A few specimens were collected on Socorro Island at an elevation of 2,000 feet above the sea, by the Academy expedition.

The variations notable in individual specimens from the northern United States seem quite sufficient to cover the differences between the northern and Mexican shells.

24. **Strobilops strebeli** Pfeiffer

Helix strebeli Pfeiffer, Mal. Blatt., VIII, p. 71, pl. 1, figs. 5-8, 1861.
Strobilops labyrinthica strebeli Pilsbry, Nautilus, VII, p. 57, 1893.

A single specimen from Socorro Island at an elevation of 2,000 feet was obtained by the Academy expedition. It agrees exactly with specimens sent by Berendt from Mirador, Mexico, where Strebel collected it. It appears not to be the shell figured by Crosse & Fischer under this name and seems to be a sufficiently good species.

Genus **Punctum** Morse, 1864

25. **Punctum pygmæum** Draparnaud

Plate 35, figures 18, 19
Plate 36, figures 15, 16, 17

Helix pygmæa Draparnaud, Hist. Moll. Terr., p. 114, 1805.
Helix minutissima Lea, Trans. Am. Phil. Soc. IX, p. 17, 1841.
Punctum minutissimum Morse, Journ. Portland Soc. Nat. Hist., 1, p. 27, figs. 69-70, pl. II, fig. 1, pl. VIII, fig. 71, 1864.

Collected by the Academy expedition on Socorro Island at an altitude of 2,000 feet, where the species appears to be abundant.

A careful comparison of British specimens of *P. pygmæum* with specimens of *P. minutissimum* from Lea's collection leads to the conclusion that Binney was justified in uniting the two, as the differences seem within the limits of specific variation. With those which seem comparable with *P. pygmæum*, from the Academy collection, are several forms which under high magnification appear distinct, if not extreme variations, which value it seems prudent to allow them at present.

Form *A.* (var. *rotundum.)*—Similar to the type in sculpture and with a small subcylindric umbilicus, but with three rounder whorls, more elevated spire, and larger than typical *pygmæum* with the same number of whorls.

Type: No. 2203, Mus. Calif. Acad. Sci.; collected on **Maria Magdalena Island**, Tres Marias.

Form *B.* (var. *albeolum.)*—Larger than typical *pygmæum*, shiny white, the sculpture subobsolete, the spire less elevated, the end of the last whorl nearly on a level with the antecedent whorl (while in *pygmæum* it is depressed), the umbilicus wider and more funnel-shaped. Whorls three and a half, the shell larger than typical *pygmæum* of the same number of whorls.

Type: No. 2204, Mus. Calif. Acad. Sci.; collected on **Maria Magdalena Island**; the species was also taken on Maria Madre Island, near the village on the east side, and on Socorro Island between 2,000 and 2,800 feet elevation on the slopes

of Mount Evermann; *paratype:* No. 2204*a* has been selected from the latter locality.

26. **Punctum planatum** Dall, new species

Plate 36, figures 12, 13, 14

Shell smaller than *P. pygmæum,* with a flat spire and three and a half whorls; the nucleus is transparent, the rest snow white; sculpture of more prominent and less close-set axial ribs; suture moderately deep; whorls and aperture rounded, the peritreme thin, not expanded; the umbilicus wide, shallow, showing a large part of the three whorls. Diameter of shell, 1 mm.

Type: No. 2205, Mus. Calif. Acad Sci.; collected on **Maria Madre Island,** near the village on the east side, by the Academy expedition.

The differences between this and the typical *P. pygmæum* seem too great for mere varietal rank.

Genus **Gastrocopta** Wollaston, 1878

27. **Gastrocopta pellucida** Pfeiffer

Pupa pellucida Pfeiffer, Symbolæ, 1, p. 46, 1841—Kuster, in Chemnitz Conch. Cab. ed. 2, *Pupa,* p. 89, pl. 12, figs. 24, 25, 1852—Strebel, Beitr. Mex. Land and Süssw. Conch. IV, p. 91, pl. 4, fig. 19.

Pupa servilis (Gould) Pfeiffer, Mon. Hel. Viv. II, p. 360.

Leucochila pellucida Tryon, Am. Journ. Conch. III, p. 308, pl. 15, fig. 24, 1868.

Pupa (Leucochilus) pellucida (Pfr.) Boettger, in Martens, Conch. Mitth. 1, p. 69, 1881.

Gastrocopta pellucida (Pfr.) Pilsbry.

Collected by the Academy expedition near the village on the east side of Maria Madre, Tres Marias Islands, and on Socorro Island at from 2,000 to 2,800 feet elevation, on the north slope of Mount Evermann.

28. Gastrocopta pellucida hordeacella Pilsbry

Pupa hordeacella PILSBRY, Proc. Acad. Nat. Sci. Phila. for 1890, p. 44, pl. 1, figs. G, H, I, J, K, Arizona and Florida.

Collected by the Academy expedition on the island of Socorro, from the low lands at Braithwaite Bay, Grayson's Cove, and at elevations of 2,000 and 2,800 feet on the slope of Mount Evermann. Also on Clarion Island from Sulphur Bay, near the sea level and at elevations of 500 and 1,040 feet above the sea.

The distribution of this species and the variety is extremely widespread, as indicated by Martens. It has been reported from the Gulf States, Mexico, Guatemala, Panama, Ecuador, and most of the Antilles.

Genus Vitrea Fitzinger, 1833

29. Vitrea indentata Say

Helix indentata SAY, Journ. Acad. Nat. Sci. Phila., vol. 2, p. 372, 1822—Gould, Invert. Mass., p. 181, fig. 109.

Hyalinia (Glyphyalinia) indentata (SAY) MARTENS, Biol. Centr. Am., p. 117, 1892.

Collected by the Academy expedition near the village on the east side of Maria Madre and at another unspecified locality on that island; also on Maria Magdalena, rather abundantly.

I have not been able to examine *V. paucilirata* Morelet, but from the figures and descriptions it would seem doubtfully distinct from the present species.

At first sight the fresh individuals from the Tres Marias impressed one as having the indented radial lines less numerous and more deeply cut than in the northern *indentata*, but on careful study of specimens of the same size no valuable differences could be observed. The island specimens on the whole seem larger on the average than those from the United States, but not extremely so. The very wide range of this species is well known. It is recorded from Canada to Texas and from the boundary to southward from the Federal District of Mexico.

July 22, 1926

Genus **Zonitoides** Lehman, 1862

30. ? **Zonitoides socorroënsis** Dall, new species

Plate 36, figures 9, 10, 11

Shell minute, polished, brownish, subtranslucent, with four whorls, having much the aspect above of a small *Z. arboreus* Say, but with a relatively more widely coiled umbilicus; the spire is low and in profile appears flattish; the sculpture is much the same as in *Z. arboreus,* both showing under high magnification microscopic pittings or obscure punctations over the entire surface; the other characters reproduce *Z. arboreus* in miniature; major diameter, 3.5; minor diameter, 3.0; height, 1.2 mm.

Type: No. 2206, Mus. Calif. Acad. Sci.; collected on **Socorro Island** on the slopes of Mount Evermann at the elevation of 2,000 to 2,800 feet above sea level, by the Academy expedition.

This may not be a *Zonitoides* but seems nearest to that genus in shell characters. There is some slight variation in the convexity of different individuals.

Genus **Tornatellides** Pilsbry, 1910

31. **Tornatellides mexicana** Dall, new species

Plate 35, figure 6

Shell light brown with about six well-rounded whorls; suture conspicuous, surface smooth and shining with faint incremental lines; base rounded, perforate; pillar with two strong but not high plaits, the parietal lamina thin and sharp; a section shows the axis continuously tubular with the plaits continuing obliquely up the spire; height, 3.5; diameter, 2.0 mm.

Type: No. 2207, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Socorro Island** on the north slope of Mount Evermann, Socorro Island, at an elevation of 2,000 to 2,800 feet.

This is smaller, more obtusely conical, and less common than the following species, from which it can be promptly distinguished by its two columellar plaits.

32. **Tornatellides clarionensis** Dall, new species

Plate 35, figure 9

Shell reddish brown with six moderately rounded whorls; suture distinct, not deep; base evenly rounded, perforate; a very slender thread-like rather than sharp parietal lamina and a feeble plait on the pillar, often invisible from in front, but stronger in the young; axis slender and twisted; height, 4.0; diameter, 2.25 mm.

Type: No. 2208, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Clarion Island** rather abundantly, at the east end, at an elevation of 500 feet, also at 1,040 feet, and near sea level at Sulphur Bay.

Doctor Pilsbry states that this is a species of the *T. simplex* group of Polynesia. It differs from all Hawaiian and Polynesian species but not more than they differ among themselves. This, *T. mexicana,* and *T. chathamensis* Dall, of the Galapagos Islands, are the only species recorded from off the American shores, but it would not be surprising if future collectors should discover the genus on the continent.

Genus **Succinea** Draparnaud, 1805

33. **Succinea clarionensis** Dall, new species

Plate 35, figure 2

Shell of moderate size, obliquely twisted, with three whorls of a dark honey-yellow color, the nuclear whorl with a faint tinge of pink; suture deep, surface more or less axially rugose from the irregularly prominent incremental lines; not polished; last whorl forming most of the shell; aperture oblique, ample, outer lip thin, sharp, inner lip with a layer of enamel uniting the outer and basal margins; periostracum more or less fibrous; height of shell, 15.5; of last whorl, 15.0; of aperture, 11.0; maximum diameter, 10.0 mm.

Type: No. 2209, Mus. Calif. Acad. Sci.; collected by the Academy expedition on **Clarion Island,** at 1,040 feet elevation.

This appears to be very abundant. Some years ago the Fish Commission steamer *Albatross* touched at Clarion Island and collected a large number of this species, but, as they were put in formalin, they arrived totally disintegrated.

34. **Succinea socorroënsis** Dall, new species

Plate 35, figure 1

Shell small, polished, very pale greenish-yellow, of nearly three whorls usually covered thickly with the animal's excretory pellets; surface more or less axially undulated by irregularities of growth; whorls well rounded, suture deep; aperture oblique, margins thin and sharp; not united over the body by a layer of enamel; height of shell, 9.0; of last whorl, 8.5; of aperture, 7.0; maximum diameter, 5.0 mm.

Type: No. 2210, Mus. Calif. Acad. Sci.; collected on **Socorro Island,** on the north slope of Mount Evermann at 2,800 feet elevation, by the Academy expedition.

This appears to be rare, as only seven specimens, old and young, were obtained.

Genus **Proserpinella** Bland

35. **Proserpinella hannæ** Dall, new species

Plate 36, figures 6, 7, 8

Shell small, depressed, white, of three and a half smooth whorls; periphery evenly rounded, suture distinct, not deep; spire very slightly convex, base in the young with an umbilical depression, in the adult covered with a flattish layer of enamel, which extends about one-third of the way from the axis to the periphery of the whorl; the last whorl is slightly depressed as it approaches the aperture, which is recessively oblique; outer lip entire, not sharp nor notably thickened, with a small excavated curve where it approaches but does not quite reach the umbilical pit; body with a very thin wash of enamel and nearly midway of the whorl a low lamella entering the whorl some

distance on the parietal wall, but absent in the young; there is no columellar fold; major diameter, 4; minor diameter, 3; altitude, 1.5 mm.

Type: No. 2211, Mus. Calif. Acad. Sci.; collected on **Maria Madre, Tres Marias Islands,** by the Academy expedition.

One adult and several immature speciments were obtained. This is the first species of the genus to be found on the western shores of Mexico. It somewhat resembles *P. berendti* Bland, from Mirador, on the Atlantic slope some 3,000 feet above sea level, but is larger, with the basal callus smaller. It is named in honor of Dr. G. Dallas Hanna, who was responsible for most of the shell-collecting done by the expedition.

Plate 35

Fig. 1. *Succinea socorroënsis* Dall, n. sp. Type, No. 2210 (C.A.S. Coll.), from Socorro Island; height, 9 mm.; p. 486.

Fig. 2. *Succinea clarionensis* Dall, n. sp. Type, No. 2209 (C.A.S. Coll.), from Clarion Island; height, 15.5 mm.; p. 485.

Fig. 3. *Oxystyla delphinus* forma *nesiotica* Dall, nov. Type, No. 2194 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; height, 59.4 mm.; p. 474.

Fig. 4 *Euglandina mariana* Dall, n. sp. Type, No. 2190 (C.A.S. Coll.), from Maria Magdalena Island, Tres Marias Group; length, 29 mm.; p. 470.

Fig. 5. *Leptinaria martensi* Pfeiffer. Plesiotype, No. 2191 (C.A.S Coll.), from Maria Magdalena Island, Tres Marias Group; length, 6 mm.; p. 472.

Fig. 6. *Tornatellides mexicana* Dall, n. sp. Type No. 2207 (C.A.S. Coll.), from Socorro Island; height, 3.5 mm.; p. 484.

Figs. 7, 8. *Pseudosubulina evermanni* Dall, n. sp. Type, fig. 7, No. 2192 (C.A.S. Coll.), from Socorro Island; height, 4.52 mm.; paratype, fig. 8, No. 2193 (C.A.S. Coll.), from Maria Magdalena Island, Tres Marias Group; p. 472.

Fig. 9. *Tornatellides clarionensis* Dall, n. sp. Type, No. 2208 (C.A.S. Coll.), from Clarion Island; height, 4 mm.; p. 482.

Figs. 10, 11. *Guppya montanicola* Dall, n. sp. Type, No. 2201 (C.A.S. Coll.), from Socorro Island; major diameter, 2.5 mm.; p. 482.

Figs. 12, 13. *Guppya perforata* Dall, n. sp. Type, No. 2198 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; major diameter, 3 mm.; p. 478.

Figs. 14, 15. *Guppya socorroana* Dall, n. sp. Type, No. 2199 (C.A.S. Coll.), from Socorro Island; major diameter, 3.1 mm.; p. 478.

Figs. 16, 17. *Thysanophora materna* Dall, n. sp. Type, No. 2196 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; major diameter, 4 mm.; p. 477.

Figs. 18, 19. *Punctum pygmæum* var. *albeolum* Dall, nov. Type, No. 2204 (C.A.S. Coll.), from Maria Magdalena Island, Tres Marias Group; major diameter, 2.4 mm.; p. 481.


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Plate 36

Figs. 1, 2. *Thysanophora clarionensis* Dall, n. sp. Type, No. 2197 (C.A.S. Coll), from Clarion Island; major diameter, 2.5 mm.; p. 477.

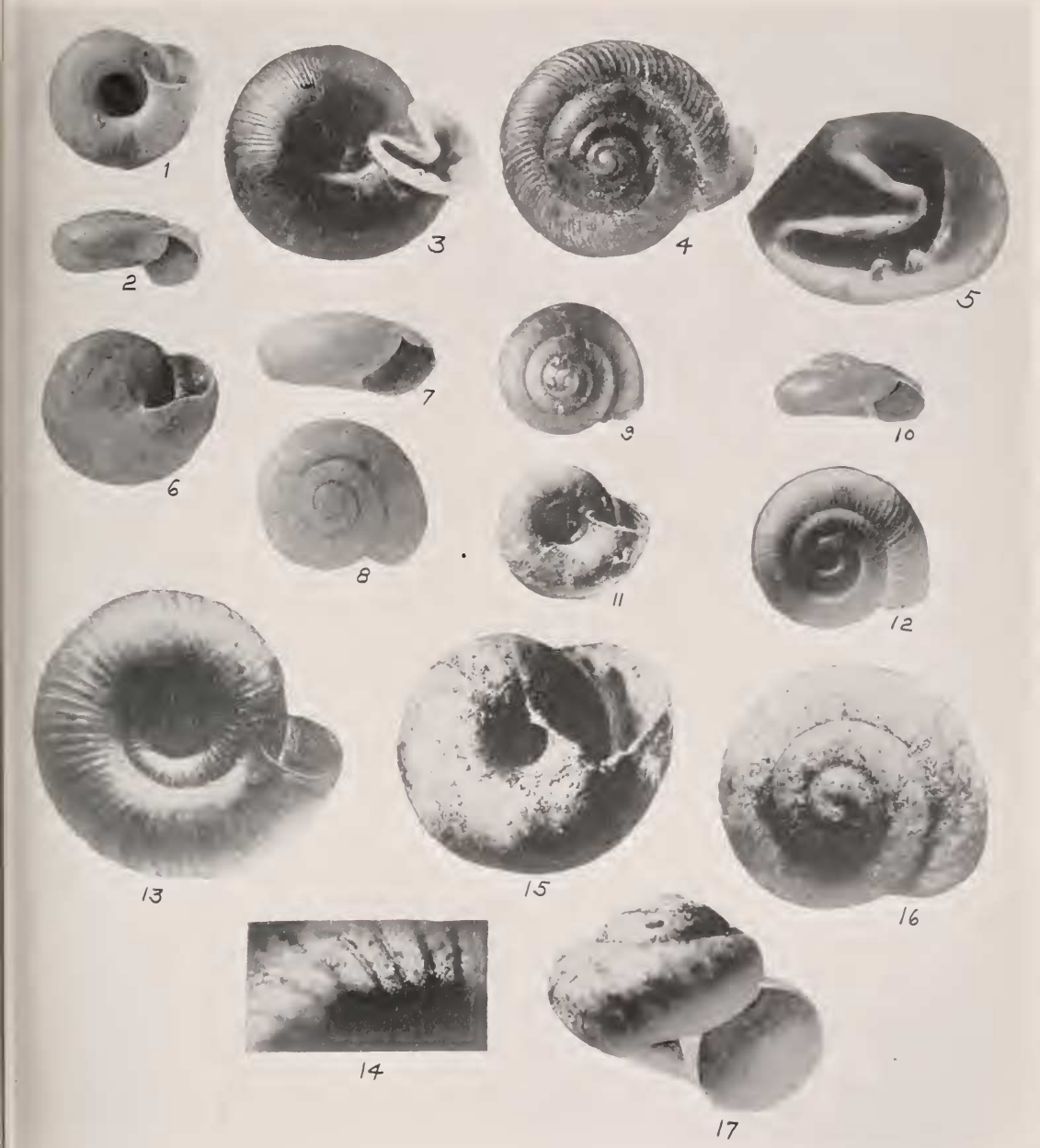
Figs. 3, 4, 5. *Polygyra richardsoni paucicostata* Pilsbry. Plesiotype, No. 2195 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; major diameter, 9.2 mm.; p. 476.

Figs. 6, 7, 8. *Proserpinella hannæ* Dall, n. sp. Type, No. 2211 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; major diameter, 4 mm.; p. 486.

Figs. 9, 10, 11. *?Zonitoides socorroënsis* Dall, n. sp. Type, No. 2206 (C.A.S. Coll.), from Socorro Island; major diameter, 3.5 mm.; p. 484.

Figs. 12, 13, 14. *Punctum planatum* Dall, n. sp. Type, No. 2205 (C.A.S. Coll.), from Maria Madre Island, Tres Marias Group; diameter, 1 mm.; p. 482.

Figs. 15, 16, 17. *Punctum pygmæum* var. *rotundum* Dall, nov. Type, No. 2203 (C.A.S. Coll.), from Maria Magdalena Island, Tres Marias Group; major diameter, 1.8 mm.; p. 481.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